

# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-41

**Name:** Dimock Lake **County:** Hutchinson

**Legal Description:** T100N-R60W-Sec. 15

**Location from nearest town:** 3 miles east of Dimock, SD

**Dates of present survey:** August 11-13, 2008 (netting); June 18, 2008 (electrofishing)

**Date last surveyed:** August 14-16, 2006 (netting); June 7, 2006 (electrofishing)

Primary Game and Forage Species	Secondary and Other Species
Largemouth Bass	Channel Catfish
Black Crappie	Yellow Perch
White Crappie	Black Bullhead
Bluegill	Common Carp
	Northern Pike
	Walleye
	Green Sunfish

## PHYSICAL DATA

**Surface Area:** 148 acres

**Maximum depth:** 18 feet

**Volume:** 847 acre-feet

**Contour map available:** Yes

**OHWM elevation:** None set

**Outlet elevation:** None set

**Lake elevation observed during the survey:** Full

**Beneficial use classifications:** (5) warmwater semi-permanent fish propagation, (7) immersion recreation, (8) limited-contact recreation and (9) fish and wildlife propagation and stock watering.

**Watershed:** 25,600 acres

**Mean depth:** 5.7 feet

**Shoreline length:** 5.3 miles

**Date mapped:** 1994

**Date set:** NA

**Date set:** NA

### Introduction

Dimock Lake was named for the nearby town of Dimock, South Dakota. The original dam was built by the Works Progress Administration in 1936. The dam was washed out in 1984 following near record precipitation in the watershed. Construction on a new dam was finished in January 1993. The lake completely refilled in February 1993 and fish stocking started later that spring.

### Ownership of Lake and Adjacent Lakeshore Properties

Dimock Lake is owned and managed by the South Dakota Department of Game, Fish and Parks (GFP). There is a 15-ft easement above the high water mark around the entire lake for public access.

## Fishing Access

The Dimock Lake Access Area has a single lane boat ramp, dock, picnic shelter, and public toilet. There are several areas suitable for shore fishing.

## Field Observations of Water Quality and Aquatic Vegetation

The water in Dimock Lake was fairly clear during the survey with a Secchi depth measurement of 91 cm (36 in). No submerged aquatic vegetation was visible but there are still large numbers of flooded trees in the lake. Cattails (*Typha spp.*) were present in shallow areas.

## BIOLOGICAL DATA

### Methods:

Dimock Lake was sampled on August 11-13, 2008 with ten overnight trap net sets. The trap nets are constructed with 19-mm-bar-mesh ( $\frac{3}{4}$  in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads. Six twenty-minute sites of nighttime electrofishing were done on June 18, 2008 to sample the largemouth bass population. Trap-net and electrofishing sites are displayed in Figure 4.

### Winterkill:

Dimock Lake suffered a moderate winterkill in 2006-2007. Only black bullheads and black crappies were sampled in spring 2007. The lake has been restocked with adult black crappies and walleyes (Table 8).

### Results and Discussion:

## Trap Net Catch

Black bullhead (94.2%) dominated the trap-net catch while white crappies (3.0%), black crappies (1.4%) and common carp (1.0%) were the next highest in abundance (Table 1). Low numbers of four other species were also sampled.

**Table 1.** Total catch from ten overnight trap net sets at Dimock Lake, Hutchinson County, August 11-13, 2008.

Species	Number	Percent	CPUE <sup>1</sup>	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	5,975	94.2	597.5	$\pm 244.1$	158.5	48	0	85
White Crappie	188	3.0	18.8	$\pm 12.1$	11.5	41	4	95
Black Crappie	89	1.4	8.9	$\pm 7.4$	59.6	64	36	116
Common Carp	62	1.0	6.2	$\pm 4.3$	2.3	0	0	82
Yellow Perch	15	0.2	1.5	$\pm 1.5$	1.2	53	0	84
Green Sunfish	12	0.2	1.2	$\pm 1.0$	0.6	8	0	92
Bluegill	2	0.0	0.2	$\pm 0.3$	7.4	--	--	--
Channel Catfish	1	0.0	0.1	$\pm 0.1$	3.8	--	--	--

\* 5 years (1999, 2000, 2002, 2004, 2006)

<sup>1</sup> See Appendix A for definitions of CPUE, PSD, RSD-P and mean Wr.

## **Largemouth Bass**

**Management objective:** Maintain a largemouth bass fishery with an electrofishing catch per hour (CPH) of at least 20 and RSD-P range of 20-40.

Only one largemouth bass was sampled in two hours of electrofishing in 2008 (Table 2). The largemouth bass population was nearly eliminated by the 2006-2007 winterkill.

**Table 2.** CPH, PSD, RSD-P and mean Wr for largemouth bass sampled by electrofishing on Dimock Lake, Hutchinson County, 1999-2008.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
CPUE		59.5		5.0		7.8		21.6		0.5
PSD		58		75		46		73		--
RSD-P		17		25		38		50		--
Mean Wr		113		114		102		103		--

## **Bluegill**

**Management objective:** Maintain a bluegill fishery with a trap net CPUE of at least 20 and RSD-18 of at least 20.

Bluegill CPUE was very low in 2008, only two bluegills were sampled (Table 3). Since bluegills and largemouth bass have similar habitat requirements, turbid water and the lack of aquatic vegetation is likely affecting both species.

**Table 3.** Bluegill trap-net CPUE, PSD, RSD-18, RSD-P, and mean Wr for Dimock Lake, Hutchinson County, 1999-2008.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
CPUE	13.4	9.6		0.1		0.8		12.9		0.2
PSD	80	93		--		--		12		--
RSD-18	24	67		--		--		1		--
RSD-P	14	5		--		--		1		--
Mean Wr	107	114		--		--		102		--

## **Black and White Crappie**

**Management objective:** Maintain a crappie fishery with a trap net CPUE of at least 20 and PSD of at least 40.

Black crappie numbers continued to decline (Table 4). Several year classes are evident on the length frequencies, with age-0 being the most abundant (Figure 1).

**Table 4.** Black crappie trap-net CPUE, PSD, RSD-P, and mean Wr for Dimock Lake, Hutchinson County, 1999-2008.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
CPUE	24.9	52.2		103.9		78.2		38.8		8.9
PSD	28	78		35		3		13		64
RSD-P	0	18		3		0		0		36
Mean Wr	108	107		98		94		93		116

White crappie trap-net CPUE and PSD continued to increase in 2008 (Table 5). White crappies ranged in length from 110-320 mm (4.3-12.6 in.) with a mean length of 178 mm (7.0 in) (Figure 2).

**Table 5.** White crappie trap-net CPUE, PSD, RSD-P, and mean Wr for Dimock Lake, Hutchinson County, 1999-2008.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
CPUE	3.9	17.1		24.4		4.2		8.0		18.8
PSD	69	80		16		0		14		41
RSD-P	0	39		8		0		3		4
Mean Wr	95	106		97		105		93		95

## **Black Bullhead**

The Dimock Lake bullhead population goes through cycles in abundance and quality (Table 6). The abundance decreases with high predator numbers and increases following fish kills. Very few fish ever reach 25 cm (10 in) (Figure 3).

**Table 6.** Black bullhead trap-net CPUE, PSD, RSD-P, and mean Wr for Dimock Lake, Hutchinson County, 1999-2008.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
CPUE	40.9	22.8		510.7		120.6		97.6		597.5
PSD	0	84		15		2		0		48
RSD-P	0	0		0		0		0		0
Mean Wr	--	88		85		76		70		85

## **All Species**

A partial winterkill in 2006-2007 reduced the abundance of channel catfish, bluegills, largemouth bass, and black crappies. Black bullheads and black crappies have consistently been the most abundant species found in Dimock Lake while the abundance of predator species remains consistently low (Table 7).

**Table 7.** Electrofishing (EF), and trap-net (TN) CPUE for all fish species sampled in Dimock Lake, Hutchinson County, 1999-2008.

<b>Species</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>COC (TN)</b>	2.3	1.8		2.1		4.4		0.7		6.2
<b>BLB (TN)</b>	40.9	22.8		510.7		120.6		97.6		597.5
<b>CCF (TN)</b>	3.7	1.9		1.9		4.8		6.9		0.1
<b>NOP (TN)</b>	--	0.1		0.6		0.2		--		--
<b>GSF (TN)</b>	0.3	--		0.2		0.6		1.8		1.2
<b>HYB (TN)</b>	--	--		--		--		2.1		--
<b>BLG (TN)</b>	13.4	9.6		0.1		0.8		12.9		0.2
<b>LMB (EF)</b>	--	59.5		5.0		7.8		21.6		0.5
<b>LMB (TN)</b>	0.1	0.1		--		--		0.3		--
<b>WHC (TN)</b>	3.9	17.1		24.4		4.2		8.0		18.8
<b>BLC (TN)</b>	24.9	52.2		103.9		78.2		38.8		8.9
<b>YEP (TN)</b>	0.3	0.2		2.6		0.4		2.3		1.5
<b>WAE (TN)</b>	0.1	--		--		0.2		--		--

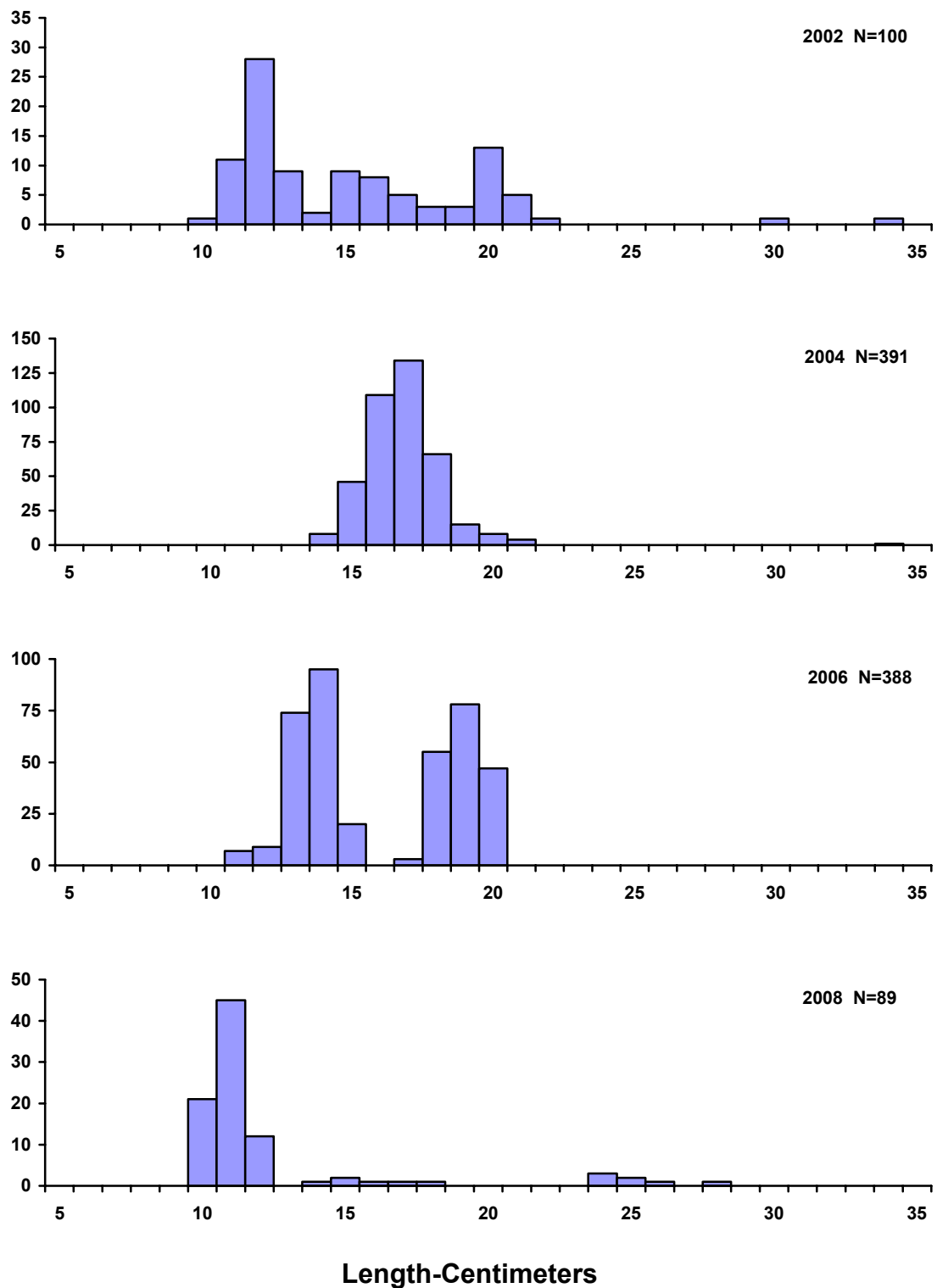
COC (Common Carp), BLB (Black Bullhead), CCF (Channel Catfish), NOP (Northern Pike), GSF (Green Sunfish), HYB (Hybrid Sunfish), BLG (Bluegill), LMB (Largemouth Bass), WHC (White Crappie), BLC (Black Crappie), YEP (Yellow Perch), WAE (Walleye),

## **MANAGEMENT RECOMMENDATIONS**

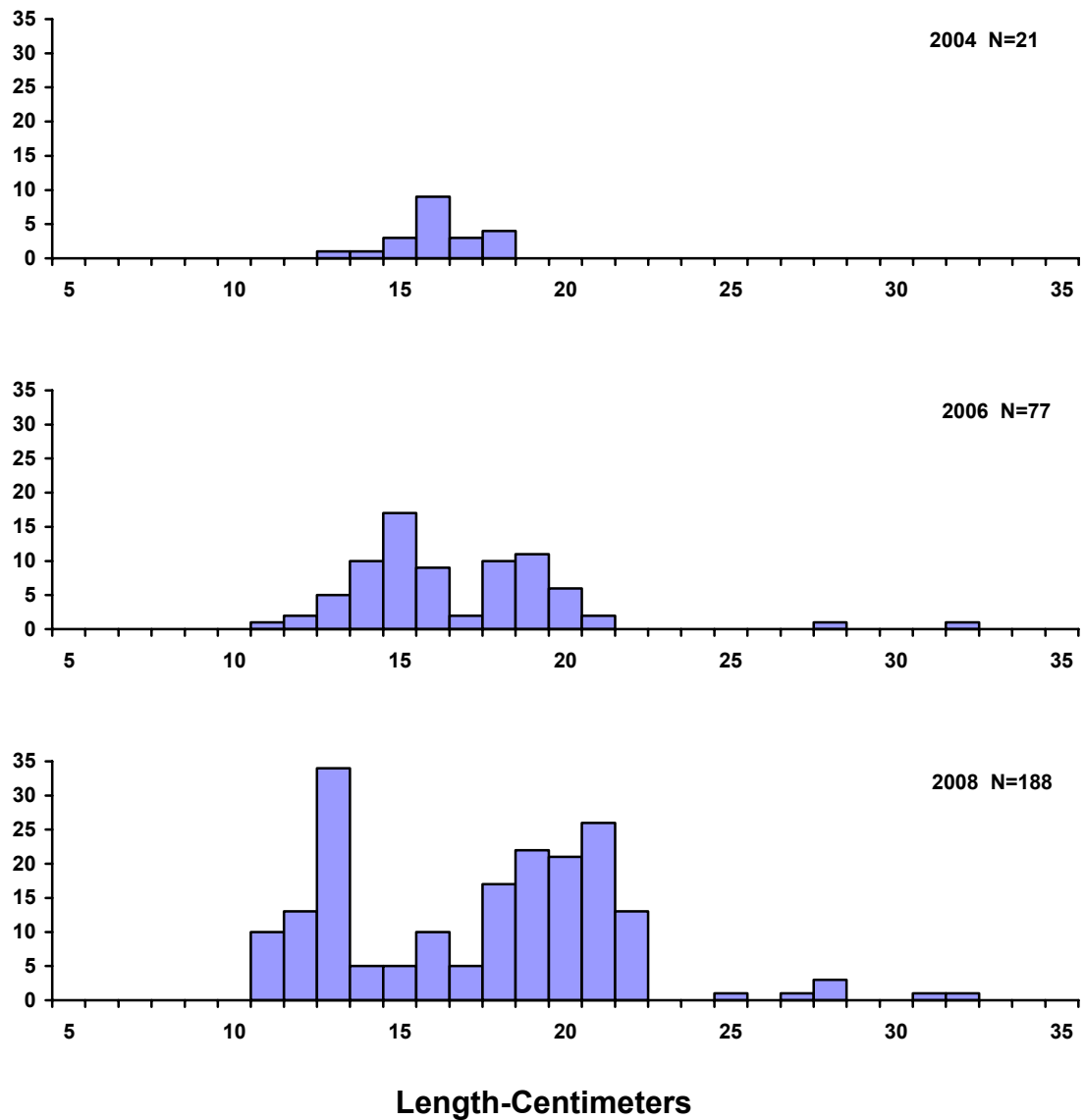
1. Discontinue largemouth bass management and stock large walleye fingerlings to supplement the predator population.
2. Stock adult channel catfish to provide additional angling opportunity and supplement the predator population.
3. Continue to conduct lake surveys every other year to monitor the fishery. Electrofishing to sample the bass population is no longer needed on a regular basis unless we observe improvements in water quality and habitat.
4. Investigate opportunities to improve water quality, such as an upstream retention pond or improvements in riparian habitat in the watershed.
5. Consider the possibility of using a drawdown to expose a portion of the lake bottom and evaluate the effects. Exposure should help compact and aerate sediments and promote the growth of aquatic vegetation.

**Table 8.** Stocking record for Dimock Lake, Hutchinson County, 1990-2008.

<b>Year</b>	<b>Number</b>	<b>Species</b>	<b>Size</b>
1993	54,450	Channel Catfish	Fingerling
	8,840	Largemouth Bass	Sml. Fingerling
	687	Yellow Perch	Adult
1994	2,100	Channel Catfish	Fingerling
	7,500	Largemouth Bass	Med. Fingerling
	2,339	Walleye	Lrg. Fingerling
	31	Walleye	Adult
	8,326	White Crappie	Fingerling
1996	7,500	Channel Catfish	Fingerling
	6,500	Largemouth Bass	Fingerling
	1,875	Walleye	Fingerling
	748	Yellow Perch	Adult
	741	White Crappie	Adult
1998	750	White Crappie	Adult
1999	750	White Crappie	Adult
2000	1,096	Black Crappie	Adult
2001	7,500	Largemouth Bass	Fingerling
2005	174	Channel Catfish	Adult
2006	150	Channel Catfish	Adult
2007	750	Black Crappie	Adult
	345	Walleye	Adult
	102	Walleye	Juvenile

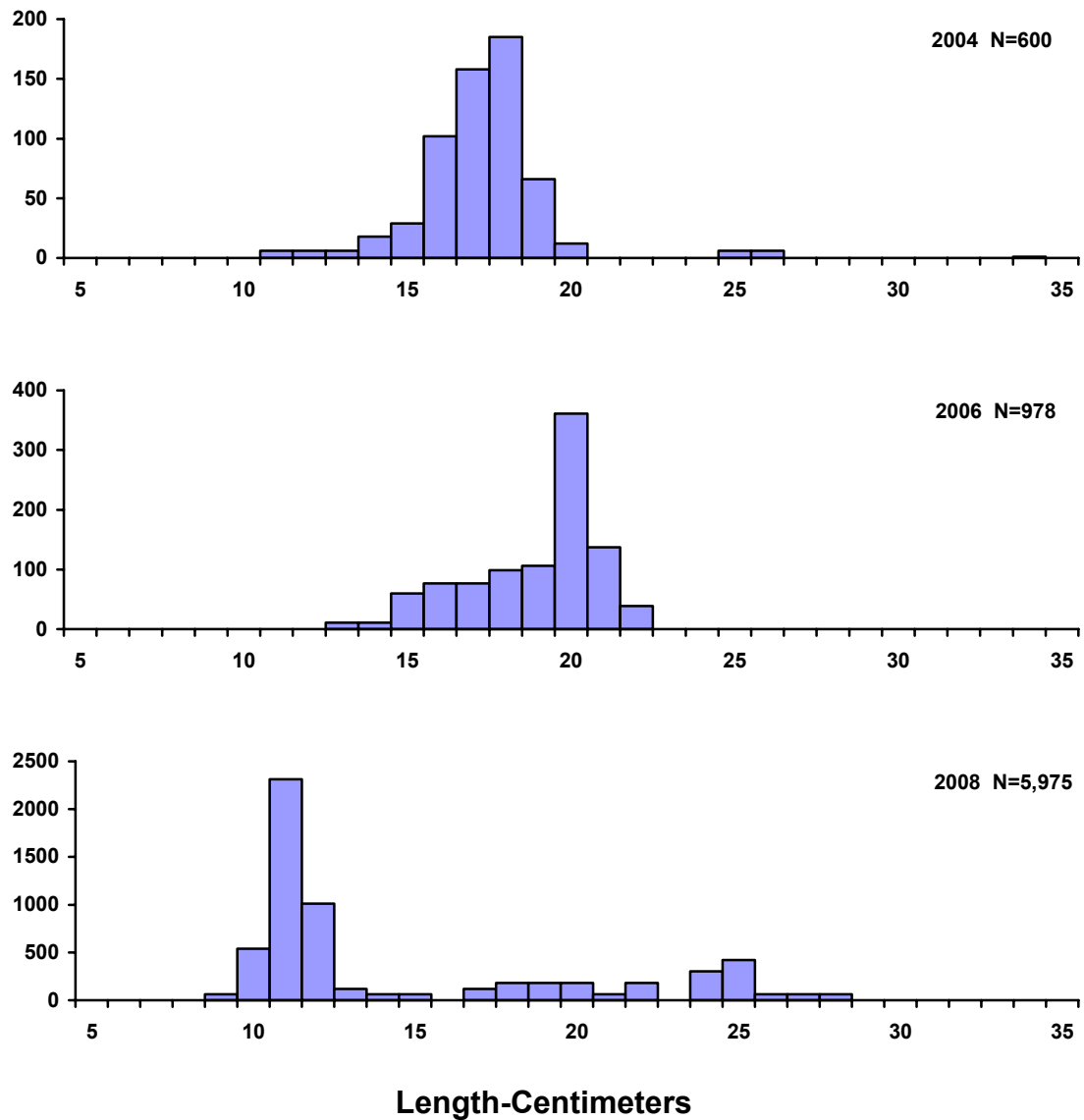


**Figure 1.** Length frequency histograms for black crappie sampled with trap nets in Dimock Lake, Hutchinson County, 2002, 2004, 2006, and 2008.



**Figure 2.** Length frequency histograms for white crappies sampled with trap nets in Dimock Lake, Hutchinson County, 2002, 2004, 2006, and 2008.

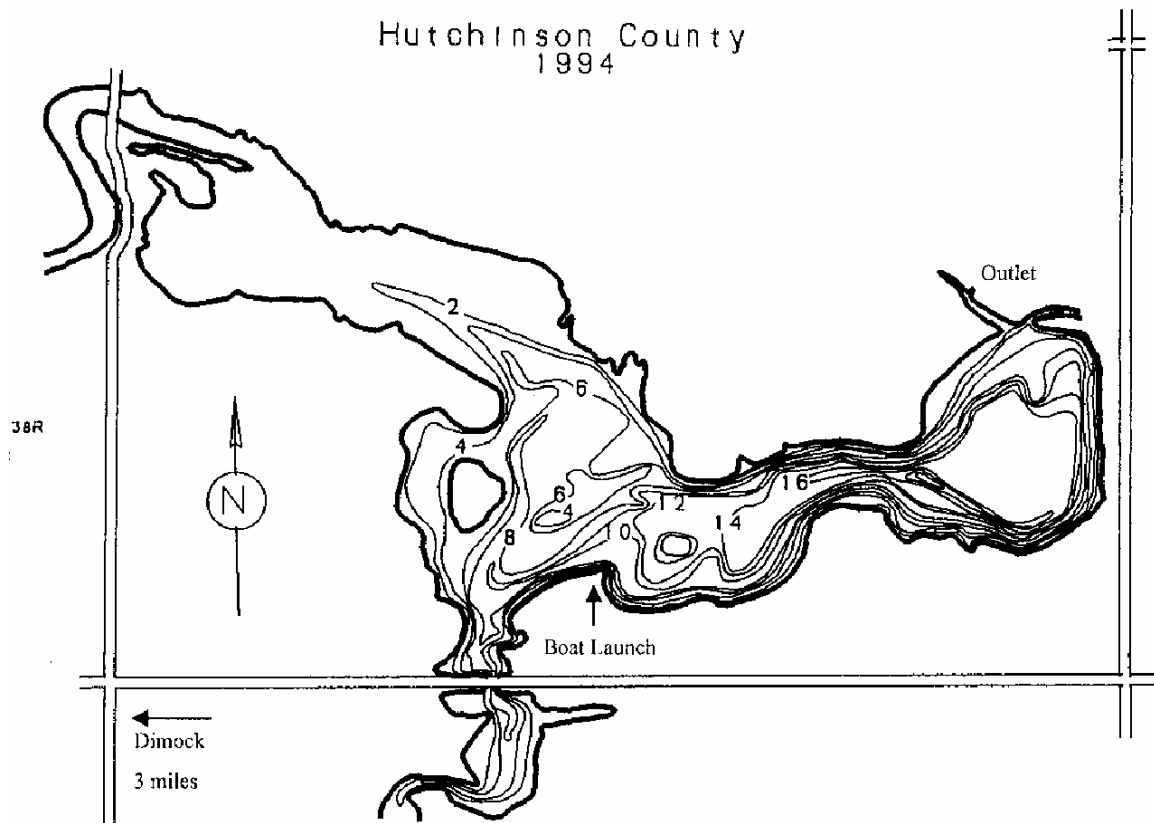




**Figure 3.** Length frequency histograms for black bullheads sampled with trap nets in Dimock Lake, Hutchinson County, 2002, 2004, 2006, and 2008.

# Dimock Lake

Hutchinson County  
1994



**Legend** Trap Net Sites: T  
Electrofishing Sites: E

**Figure 4.** Sampling sites on Dimock Lake, Hutchinson County, 2008.

**Appendix A.** A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

**Catch Per Unit Effort (CPUE)** is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

**Proportional Stock Density (PSD)** is calculated by the following formula:

$$\text{PSD} = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

**Relative Stock Density (RSD-P)** is calculated by the following formula:

$$\text{RSD-P} = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters.

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25	38	51	63	76
Sauger	20	30	38	51	63
Yellow perch	13	20	25	30	38
Black crappie	13	20	25	30	38
White crappie	13	20	25	30	38
Bluegill	8	15	20	25	30
Largemouth bass	20	30	38	51	63
Smallmouth bass	18	28	35	43	51
Northern pike	35	53	71	86	112
Channel catfish	28	41	61	71	91
Black bullhead	15	23	30	38	46
Common carp	28	41	53	66	84
Bigmouth buffalo	28	41	53	66	84
Smallmouth buffalo	28	41	53	66	84

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

**Relative weight (Wr)** is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.